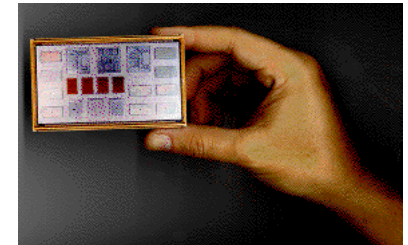# Radio Metric Tracking

- **Develop/demonstrate/transfer new technology for autonomous positioning and navigation**
  - GPS technology for near-Earth
  - GPS-derivatives for deep space/interplanetary
  - Autonomous spacecraft with onboard navigation
  - Autonomous Formation Flyer (AFF) sensor
  - Differential & same-beam tracking techniques

- **Goals and Products**
  - µGPS bit-grabber receiver (< 0.1 watt)
  - Real-time software system for GPS positioning
  - Industry partnerships and technology thrusts
  - Real-time deep space systems for autonomous navigation, formation flying, rendezvous, orbiter/lander
  - Planetary ephemeris: 5 nrad Mars, 20 nrad Jupiter
  - 1-m orbiter, lander positioning

Advanced flight hardware for autonomous spacecraft nav

Precision, automated GPS software and positioning systems

Timeline:

- Provisional ops GPS Calib. Sys.
- SNOE µGPS launch
- STRV µGPS h/w delivery
- Mars diff. tracking demo
- Real-time GPS aircraft demo
- X-33 real-time demo
- Prototype AFF
- GPS on a chip
- AFF delivery to DS-3
- Mars rover-orbiter diff. tracking demo
- LightSAR POD
- AFF+ delivery to DS-4
- Mars rover-orbiter diff. tracking opportunity

FY98 | FY99 | FY00 | FY01 | FY02 | FY03